LISTING OF THE CLAIMS:

A complete listing of the claims is provided below. This listing of the claims replaces all prior versions and listings of claims in the application.

Please cancel claims 1-30 without prejudice or disclaimer of the subject matter disclosed therein. Please add new claims 31-60 as follows:

1. (Cancelled)
2. (Cancelled)
3. (Cancelled)
4. (Cancelled)
5. (Cancelled)
6. (Cancelled)
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16. (Cancelled)
17. (Cancelled)
18. (Cancelled)
19. (Cancelled)
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21. (Cancelled)

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25. (Cancelled)

26. (Cancelled)

27. (Cancelled)

28. (Cancelled)

29. (Cancelled)

30. (Cancelled)

31. (New) A method for semi-solid metal casting, comprising:

providing a first alloy, the first alloy including an aluminum-silicon hypoeutectic alloy;

providing a second alloy, the second alloy including a grain refiner;

providing a reactive material;

liquefying at least one of the first alloy and the second alloy by heating to a first temperature;

combining the reactive material and the second alloy to form a mixture;

combining the first alloy and the mixture to form a combination;

generating a semi-solid metal by cooling the combination to a second temperature, wherein the semi-solid metal includes a multitude of aluminum particles having a particle size and a particle number;

injecting the semi-solid metal into a die cavity to form a cast product; and

controlling the particle size and the particle number by modulating the second temperature and an elapse time between the generation of the semi-solid metal and the injection.

32. (New) The method of claim 31, wherein the particle size is minimized by reducing the elapse time.

33. (New) The method of claim 31, wherein the particle number is maximized by reducing the elapse time.

34. (New) The method of claim 31, wherein the elapse time is reduced by combining the first alloy with the second alloy, the first alloy having a relatively lower temperature than the second alloy.

35. (New) The method of claim 31, wherein the second alloy comprises at least one of titanium, niobium, tantalum, vanadium, molybdenum, zirconium, and beryllium.

36. (New) The method of claim 31, wherein the reactive material comprises at least one of aluminum, boron, carbon, sulfur, phosphorus, and nitrogen.

37. (New) The method of claim 31, wherein the cast product comprises aluminum particles having an average diameter of less than about 70 microns.

38. (New) The method of claim 37, wherein the cast product comprises aluminum particles having an average diameter from about 40 microns to about 60 microns.

39. (New) The method of claim 31, further comprising heating both the first alloy and the second alloy.

40. (New) The method of claim 31, wherein the first temperature is greater than about 617°C.

41. (New) The method of claim 40, wherein the first temperature is about 1135°C.

42. (New) The method of claim 31, wherein the first temperature is about 600°C to about 700°C.

43. (New) The method of claim 42, wherein the first temperature is about 612°C to about 630°C.

44. (New) The method of claim 31, wherein the first temperature is about 1135°C.

45. (New) The method of claim 31, wherein the first alloy comprises about less than 11.7% silicon.

46. (New) The method of claim 45, wherein the first alloy comprises about 6% to about 8% silicon.

47. (New) The method of claim 46, wherein the first alloy comprises about 7% silicon.

48. (New) The method of claim 31, wherein the second alloy comprises about 1% to about 10% titanium.

49. (New) The method of claim 48, wherein the second alloy comprises about 2% to about 5% titanium.

50. (New) The method of claim 49, wherein the second alloy comprises about 3% to about 5% titanium.

51. (New) The method of claim 31, wherein the cast product comprises about less than 1% titanium.

52. (New) The method of claim 51, wherein the cast product comprises about 0.2% to about 0.5% titanium.

53. (New) The method of claim 52, wherein the cast product comprises about 0.25% to about 0.3% titanium.

54. (New) A cast product made by a semi-solid metal casting method, comprising:

a first alloy including an aluminum-silicon hypoeutectic alloy;

a second alloy including a grain refiner, wherein at least one of the first alloy and the second alloy is liquefied by heating to a first temperature;

a reactive material;

a mixture formed by combining the reactive material and the second alloy;

a combination formed by combining the first alloy and the mixture; and

a semi-solid metal formed by: cooling the combination to a second temperature, the semi-solid metal including a multitude of aluminum particles having a particle size and a particle number; injecting the semi-solid metal into a die cavity; and controlling the particle size and the particle number by modulating the second temperature and an elapse time between the formation and injection of the semi-solid metal.

55. (New) The cast product of claim 54, wherein the particle size is minimized by reducing the elapse time.

56. (New) The cast product of claim 54, wherein the particle number is maximized by reducing the elapse time.

57. (New) The cast product of claim 54, wherein the elapse time is reduced by combining the first alloy with the second alloy, the first alloy having a relatively lower temperature than the second alloy.

58. (New) The cast product of claim 54, wherein the second alloy comprises at least one of titanium, niobium, tantalum, vanadium, molybdenum, zirconium, and beryllium.

59. (New) The cast product of claim 54, wherein the reactive material comprises at least one of aluminum, boron, carbon, sulfur, phosphorus, and nitrogen.

60. (New) The method of claim 54, wherein the aluminum particles have an average diameter from about 40 microns to about 60 microns.